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SOUTH FLORIDA WATER MANAGEMENT MODEL V5.0 INPUT MAN PAGE FOR						
canal_struc_specs.dat (previously known as cndta22*)						
canal_struc_specs.dat == Defines data related to canals to be simulated such as geometry, conductivity, basin location, mean seasonal head drops along canal, number of canal outlet structures, etc. In addition data such as number of water supply branches, canal maintenance levels, etc. are defined when appropriate.						
Data related to each outlet structure are defined in several records. Input data consists of geometry, headwater/tailwater location, recipient of discharge from structure, type/purpose of structure, discharge coefficient, capacity, flood control operations, priority in water supply network, constraints/triggers to flow, etc. The input format depends on the type of outlet structure. In addition, a distinction is made between structures that are modeled by general code and structures modeled by special code. Special operating criteria is also input for several structures.						
Near the end of the file, structure names that cannot be automated for the "B" part of the output DSS file (daily_str_flw.dss) are listed.						
assigned unit number 11 in ALTWMM read in subroutine: cnldata.F						
*** See water_supply_canal_network.ppt for more information on how to setup the LEC Water Supply Network ***						

COLS.	VAR.NAME	FORMAT	DESCRIPTION
1.	LIST OF STRUCTURES WITH DOWNSTREAM STAGE TARGETS LIMITING FLOW: (1 or more records)		

FREE FORMAT

NO_OF_STRUC_W_DS_TARG_NO_RES
FREE

Number of structures with downstream nodal stage targets as limit to flow.

@ NOTE: The arrays below are defined for K=1,NO_OF_STRUC_W_DS_TARG_NO_RES.

STRUC_NAME_W_TARG(K) FREE

Character string identification of structure with downstream nodal stage target as limit to flow (max of 6 characters).

FRC_FLOW_TARG(K) FREE

Fraction of flow released when stage is ABOVE stage target.

2. LIST OF STRUCTURES SIMULATED BY SPECIAL CODE: (1 or more lines)
FORMAT(I5,2X,20(A6,1X),5(/7X,20(A6,1X)))

1-5 NO_STRUC_SPEC I5 Number of structures simulated by special code.

6-7 BLANK 2X

@ NOTE: I is a counter of the number of structures simulated by special code.

8-13 STRNAME_SPEC(I) A6 Character string identification of structure simulated by special code (max of 6 characters).

14-14 BLANK 1X

@ NOTE: A maximum of 20 structures can be defined in each line. Input as many lines as needed to define the total number of structures. If more than 20 structures are simulated using special code (NO_STRUC_SPEC>20), the format of the following lines are slightly different (The first 7 columns are blank, 7X).

@ NOTE: The location (index) of a structure name in this array is hardcoded in the SFWMM with the purpose of providing some flexibility in naming structures. Therefore, extreme care should be exercised to keep the structure name at its correct location (i.e. to associate the right structure name with its corresponding index).

@ NOTE: This section is followed by a blank line.

3. CANAL INFORMATION: (1 record)

FORMAT(A5,1X,2F5.1,5F7.1,2X,A5,4I5,2x,A2)

1-5	CNME	A5	Character string identification of canal (max of 5 characters). Canal name and order should match that of the canal_grid_loc.dat input file.
6-6	BLANK	1X	
@ NOTE: N is a canal counter. I is a season counter.			
7-11	HDC(N,I) for I=1	F5.1	Dry season mean head drop (ft) of water surface along the canal from upstream to downstream end.
12-16	HDC(N,I) for I=2	F5.1	Wet season mean head drop (ft) of water surface along the canal from upstream to downstream end.
17-23	WIDTH(N)	F7.1	Average width of canal (ft).
24-30	CHHC(N)	F7.1	Channel hydraulic conductivity (ft/day/ft of head difference).
31-37	CRMIN(N,I) for I=1	F7.1	If canal is NOT a flow-through canal (as specified in the lecdef input file), the specified value is the desired dry season minimum canal stage (ft NGVD) to be maintained by local and/or regional water supply sources; -9.5 means that canal is NOT maintained by the water supply network. If canal acts as flow-through for water supply deliveries to downstream canals (as specified in the lecdef input file), the specified value is the dry season minimum stage (ft NGVD) at which canal may be used as a local source of water for meeting downstream water supply needs. That is, if canal stage is greater than the specified value then local water can be delivered from the canal to maintain downstream canals. However, if canal stage is lower than the specified value, water from the regional system can be delivered through the canal to maintain downstream canals (i.e. if there is a connection to the regional system, inflows into the

canal flow out immediately).
-9.5 means that canal is NOT used as a
local source of water.

38-44	CRMIN(N,I) for I=2	F7.1	Equivalent to CRMIN(N,I) for I=1 above, but values are for the wet season.
45-51	BEGSTG(N)	F7.1	Initial stage (ft NGVD) at downstream end of canal.
52-53	BLANK	2X	
54-58	UPSTRM_CANAL_NAME(N)	A5	If there are upstream water supply needs for computation of total water supply needs in the network branch, input the upstream water supply canal. If there are NO upstream water supply needs for computation of total water supply needs in the network branch input 'NOCNL'.
59-63	NBRANCH(N)	I5	Number of downstream branches in the water supply network. If NONE, enter 1. This number must equal the number of downstream canals in the network which list this canal as the upstream water supply canal.
64-68	LCNB(N)	I5	Hydrologic basin identifier of canal. This identifier determines whether canal has surface water interaction with the grid cell(s) through which it passes. If identifier is same as identifier input for grid cell(s) in the statdta file, then surface water interaction exists between the canal and the grid cell. Otherwise, no surface water interaction exists.
69-73	NOUT(N)	I5	Number of outlet structures simulated as fixed crest weirs.
74-78	ISERV_AREA_LOC(N)	I5	Lower East Coast Service Area in which canal is located. If 1: Palm Beach and Northern Broward counties.

2: Remainder of Broward County.
3: Miami-Dade County.

79-80 BLANK 2X

81-82 COUNTY_LOC A2 County in which canal is located:
 If PB: Palm Beach County.
 BR: Broward County.
 DA: Miami-Dade County.

4. WEIR INFORMATION: (NOUT(N) records)
 FORMAT(A6,2X,A5,2X,2(2i6,1X),F7.2,2F7.1)

@ NOTE: N is a canal counter. I is a counter of fixed crest weirs.

1-6	WEIR_NAME(N,I)	A6	Character string identification of weir (max of 6 characters).
7-8	BLANK	2X	
9-13	CINTO(N,I)	A5	Character string identification of canal receiving discharge from weir (max of 5 characters). If OCEAN: Structure discharges directly to ocean. If LAND: Structure discharges to grid cell.
14-15	BLANK	2X	
16-21	COLPOS_WU(I)	I6	Column location of cell where headwater canal reach is located.
22-27	ROWPOS_WU(I)	I6	Row location of cell where headwater canal reach is located.
28-28	BLANK	1X	
29-34	COLPOS_WD(I)	I6	Column location of cell where tailwater is located. If -901: Weir discharges out of the model grid domain.
35-40	ROWPOS_WD(I)	I6	Row location of cell where tailwater is located. If -901: Weir discharges out of the model grid domain.

41-41	BLANK	1X	
42-48	STRCF(N,I)	F7.2	Discharge coefficient (cfs) if structure is actually a fixed crest weir and discharge data is available. Otherwise, it is simply a calibration coefficient.
49-55	CREL(N,I)	F7.1	Weir crest elevation (ft NGVD). Headwater stage above which discharge occurs.
56-62	GWDTH(N,I)	F7.1	Crest length (ft) which should be less than or equal to canal width.

@ NOTE: Discharge equation is of the following form:

DISCHARGE = DISCGF * CREST LENGTH * (HW - CREST ELEVATION) ** 1.5

WHERE:

HW IS HEADWATER (FT NGVD) AT STRUCTURE

5. STRUCTURE INFORMATION: (1 record)

FORMAT(3X,I3,6I5)

@ NOTE: N is a canal counter. I is a counter of fixed crest weirs or other structures whose outflow is directly to ocean.

1-3	BLANK	3X	
4-6	NTIDEOUT(N)	I3	Number of simulated fixed crest weirs or other structures whose outflow is directly to ocean.

@ NOTE: Array YCNLNODE(N,I) below is defined and the read format is repeated for I=1,NTIDEOUT(N). Input for last element of YCNLNODE(N,I) ends in column X.

7-11	YCNLNODE(N,I)	I5	Row location of cell where structure discharging directly to ocean is located.
X+1-X+5	NSTRCTR(N)	I5	Number of additional outlet structures simulated whose rating curve is known (source: structure books, personal communication, etc.). @ NOTE: Total number of outlet structures from canal is equal to NOUT(N)+NSTRCTR(N).

6. STRUCTURE NAME: (1 record)

FORMAT(A6)

@ NOTE: N is a canal counter. I is a counter of additional outlet structures simulated whose rating curve is known.

1-6	STR_ID(N,I)	A6	Character string identification of structure (max of 6 characters).
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7. GRID LOCATION OF HEADWATER AND TAILWATER: (1 record)
FORMAT(4I6)

@ NOTE: I is a counter of additional outlet structures simulated whose rating curve is known.

1-6	COLPOS_SU(I)	I6	For gravity structures, column location of cell where headwater canal reach is located and at which operations are specified.
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For pumps, column location of cell along canal at which operations are specified (not necessarily cell immediately upstream of pump).

7-12	ROWPOS_SU(I)	I6	For gravity structures, row location of cell where headwater canal reach is located and at which operations are specified.
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For pumps, row location of cell along canal at which operations are specified (not necessarily cell immediately upstream of pump).

8-18	COLPOS_SD(I)	I6	Column location of cell where tailwater is located.
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19-24	ROWPOS_SD(I)	I6	Row location of cell where tailwater is located.
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@ NOTE: -901 in any of these fields means that location is NOT used for structure.

8. TYPE OF CODE USED: (1 record)
FORMAT(I6)

@ NOTE: N is a canal counter. I is a counter of additional outlet structures simulated whose rating curve is known.

1-6	ISPEC(N,I)	I6	Index for type of code used to simulate
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structure.
If 0: general code
1: special code unique to structure

9. TYPE OF RECIPIENT OF DISCHARGE FROM STRUCTURE: (1 record)
FORMAT(I6)

@ NOTE: N is a canal counter. I is a counter of additional outlet structures simulated
whose rating curve is known.

1-6	IRCEIVE(N,I)	I6	Index for type of recipient of discharge from structure. If 1: canal 2: grid cell(s) 3: hydrologic basin
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10. IDENTIFICATION OF RECIPIENT OF DISCHARGE FROM STRUCTURE: (1 record)
VARIABLE FORMAT DEPENDING ON VALUE OF IRCEIVE(N,I)

@ NOTE: N is a canal counter. I is a counter of additional outlet structures simulated
whose rating curve is known.

*IF IRCEIVE(N,I) = 1 (canal receives discharge from structure):
FORMAT(A5)

1-5	CIDNCNL(N,I)	A5	Character string identification of canal receiving discharge from structure (max of 5 characters)
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*IF IRCEIVE(N,I) = 2 (grid cell(s) receive discharge from structure):
FORMAT(5X,I3,20I5)

1-5	BLANK	5X	
6-8	NCELLS_REC(N,I)	I3	Number of grid cells receiving discharge from structure.

@ NOTE: The arrays below are defined and the read format is repeated for
J=1,NCELLS_REC(N,I).

9-13	IXRCV(N,I,j)	I5	Column location of cell receiving discharge from structure.
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14-18	IYRCV(N,I,j)	I5	Row location of cell receiving discharge from structure.
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*IF IRCEIVE(N,I) = 3 (hydrologic basin receives discharge from structure):
FORMAT(5X,10I5)

1-5	BLANK	5X
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6-10	IRVBSN(N,I)	I5	Hydrologic basin number receiving discharge from structure. @ NOTE: Number needs to match CBN value in statdta input file.
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11. PRIORITY FOR WATER SUPPLY DISCHARGES: (1 record)
FORMAT(I6)

@ NOTE: N is a canal counter. I is a counter of additional outlet structures simulated whose rating curve is known.

1-6	NPRTY(N,I)	I6	Priority Index for water supply discharges. If 0: Shared adversity. The same percentage of demand is met downstream of each structure. Non-zero: Number in priority list. 1 means structure is first priority in meeting demands downstream from canal. 2 means structure is second priority in meeting demands downstream of canal...
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12. OPEN/ON CANAL STAGE FOR OPERATING STRUCTURE FOR FLOOD CONTROL PURPOSES:
(1 record)
FORMAT(2F6.2)

@ NOTE: N is a canal counter. I is a counter of additional outlet structures simulated whose rating curve is known. J is a season counter.

1-6	RMXSTG(N,I,J) for J=1	F6.2	Dry season stage (ft NGVD) at downstream end of canal, gates (for spillways and gated culverts) are open full or pumps are turned on for flood control purposes.
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7-12	RMXSTG(N,I,J) for J=2	F6.2	Wet season stage (ft NGVD) at downstream end of canal, gates (for spillways and gated culverts) are open full or pumps are turned on for flood control purposes.
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13. CLOSE/OFF CANAL STAGE FOR OPERATING STRUCTURE FOR FLOOD CONTROL PURPOSES:
(1 record)
FORMAT(2F6.2)

@ NOTE: N is a canal counter. I is a counter of additional outlet structures simulated
whose rating curve is known. J is a season counter.

1-6	RMXSTGS(N,I,J) for J=1	F6.2	Dry season stage (ft NGVD) at downstream end of canal, the gates (for spillways and gated culverts) are closed or pumps are turned off for flood control purposes.
7-12	RMXSTGS(N,I,J) for J=2	F6.2	Wet season stage (ft NGVD) at downstream end of canal, the gates (for spillways and gated culverts) are closed or pumps are turned off for flood control purposes.

14. FACTORS LIMITING DISCHARGE FROM STRUCTURE: (1 record)
FORMAT(F6.2,1X,I2,1X,I2,5(2I3,F6.2))

@ NOTE: N is a canal counter. I is a counter of additional outlet structures simulated
whose rating curve is known.

1-6	RMINHD(N,I)	F6.2	Minimum head difference (ft) across structure for discharge to occur.
7-7	BLANK	1X	
8-9	IDES_CAP_LIMIT(N,I)	I2	Index indicating if structure discharge is limited to capacity. If 0: Discharge from structure is NOT limited to capacity. 1: Discharge from structure is limited to capacity.
10-10	BLANK	1X	
11-12	NDSGLIM(N,I)	I2	Number of downstream grid locations limiting discharge from structure.

@ NOTE: The arrays below are defined and the read format is repeated for J=1,NDSGLIM(N,I).

13-14	IXGLIM(N,I,J)	I3	Column location of downstream grid cell limiting discharge from structure.
15-17	IYGLIM(N,I,J)	I3	Row location of downstream grid cell limiting discharge from structure.
18-23	FL_TRIG_CONSTRT(N,I,J)	F6.2	Stage (ft NGVD) above which discharge from structure would be zero.

@ NOTE: If stage at ANY ONE of NDSGLIM(N,I) locations is ABOVE the threshold, discharge from structure is zero.

15. RESERVOIRS RECEIVING DISCHARGE FROM STRUCTURE: (1 record)
 FORMAT(I6,2X,5(A6,2X,F5.2,2X,A5,2X,I1,2X,A6,2X))

@ NOTE: N is a canal counter. I is a counter of additional outlet structures simulated whose rating curve is known.

1-6	NRES(N,I)	I6	Number of reservoirs receiving discharge from structure.
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7-8	BLANK	2X	
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@ NOTE: The arrays below are defined and the read format is repeated for IR=1,NRES(N,I).

9-14	RES_NAME_FRM_CNL(N,I,IR)	A6	Character string identification of reservoir receiving discharge from structure (max of 6 characters).
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15-16	BLANK	2X	
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17-21	PCTRES(N,I,IR)	F5.2	Fraction of discharge through structure entering reservoir.
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22-23	BLANK	2X	
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24-28	TARG_NAME_BYP_RES(IR)	A5	Name of target area referenced in file stage_import_specs.dat. Used to decide if outflow from structure is routed to reservoir or not.
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29-30	BLANK	2X	
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31-31	IOPT_TO_DEIVER_BEL_TARG(N,I,IR)	I1	Index indicating criteria for routing outflow from structure to reservoir.
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If 0: Outflow from structure is delivered
to reservoir if stage at target
location is ABOVE target level.
1: Outflow from structure is delivered
to reservoir if stage at target
location is BELOW target level.

32-33 BLANK 2X

34-39 NAME_OF_INFLOW_STRUC_RES(N,I,IR) A6 Name of inflow structure in reservoir used
as limit to discharge from outlet structure.

40-41 BLANK 2X

16. CANALS WHICH HAVE A MAXIMUM STAGE ALLOWED FOR INFLOW OF UPSTREAM FLOOD CONTROL
DISCHARGES: (1 record)
FORMAT(I6,2X,5(A5,2X,F7.2,2X))

@ NOTE: N is a canal counter. I is a counter of additional outlet structures simulated
whose rating curve is known.

1-6 NDSCLIM(N,I) I6 Number of canals which have a maximum
stage allowed for inflow of upstream
flood control discharges.

7-8 BLANK 2X

@ NOTE: The arrays below are defined and the read format is repeated for J=1,NDSCLIM(N,I).

9-13 DS_CANAL_NAME_LIM(N,J) A5 Character string identification of canal
which has a maximum stage allowed for
inflow of upstream flood control
discharges (max of 5 characters).

14-15 BLANK 2X

16-22 CNLSTG(N,I,J) F7.2 Maximum stage (ft NGVD) allowed on canal
DS_CANAL_NAME_LIM(N,J) for flood control
discharges through STR_ID(N,I) to occur.

23-24 BLANK 2X

@ NOTE: For S-333 and S-355: L29 stage constraint during wet season.

17. NUMBER OF FLOW MANAGEMENT REGIMES FOR EACH STRUCTURE: (1 record)
FORMAT(I6)

@ NOTE: N is a canal counter. I is a counter of additional outlet structures simulated whose rating curve is known.

1-6	NCOEFF(N,I)	I6	Number of flow management regimes for each structure which would require different discharge coefficients.
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@ NOTE: Additional information is input here for COMBQ (Combination of S-331 and S-173), S-333, S-355 and S-197.

*****START OF ADDITIONAL INPUT FOR COMBQ, S-333, AND S-355*****

A. CELL STAGE TRIGGERS FOR DETERMINATION OF FLOOD CONTROL DISCHARGES: (1 record)
FORMAT(I6,2X,5(F6.2,1X))

@ NOTE: N is a canal counter. I is a counter of additional outlet structures simulated whose rating curve is known.

1-6	N_TRIGGER_FC(N,I)	I6	Number of cell stage triggers for determination of flood control discharges from structure.
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7-8	BLANK	2X
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@ NOTE: The arrays below are defined and the read format is repeated for
J=1,N_TRIGGER_FC(N,I).

9-14	STG_TRIGGER_FL(N,I,J)	F6.2	Stages (ft NGVD) at cell trigger location triggering flood control discharges from structure. For COMBQ: Stage triggers at Angel's Well. S-333: G-3273 stage constraint. S-355: G-3273 stage constraint.
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15-15	BLANK	1X
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B. CANAL STAGE TRIGGERS FOR DETERMINATION OF FLOOD CONTROL DISCHARGES: (1 record)
FORMAT(I6,2X,5(F6.2,1X))

@ NOTE: N is a canal counter. I is a counter of additional outlet structures simulated whose rating curve is known.

1-6	N_STG_MIN_CNL(N,I)	I6	Number of canal stage triggers for determination of flood control discharges from structure.
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7-8	BLANK	2X
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@ NOTE: The arrays below are defined and the read format is repeated for
J=1,N_STG_MIN_CNL(N,I).

9-14	STG_MIN_FC(N,I,J)	F6.2	Stages (ft NGVD) at canal trigger location triggering flood control discharges from structure. For COMBQ: Headwater stages used to limit flood control. S-333: Dry season L29 stage constraint. S-355: Dry season L29 stage constraint.
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15-15	BLANK	1X
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*****END OF ADDITIONAL INPUT FOR COMBQ, S-333, AND S-355*****

*****START OF ADDITIONAL INPUT FOR S-355*****

A. ADDITIONAL CRITERIA FOR DETERMINATION OF FLOOD CONTROL DISCHARGES THRU S-355:
(1 record)
FREE FORMAT

FRAC_REG_FLOW_NESRS_S355	Fraction of regulatory releases through S-355 to NESRS when stage at G-3273 is ABOVE threshold.
FREE	

*****END OF ADDITIONAL INPUT FOR S-355*****

*****START OF ADDITIONAL INPUT FOR S-333*****

A. ADDITIONAL CRITERIA FOR DETERMINATION OF FLOOD CONTROL DISCHARGES THRU S-333/S-334:
(1 record)
FREE FORMAT

FRAC_REG_FLOW_NESRS_S333	Fraction of regulatory releases through S-333 to NESRS when stage at G-3273 is ABOVE threshold.
FREE	

IOPT_FOR_REG_RELEASES_S334	Option for releases thru S-333 and S-334 to help WCA-3A and Sparrow. If 0: NEVER have releases thru S-334. 1: Releases thru S-334 when AT LEAST S-12A is closed. 2: Releases when AT LEAST S-12A and S-12B are closed. 3: Releases thru S-334 when AT LEAST S-12A, S-12B, and S-12C are closed.
FREE	

- 4: Releases thru S334 when AT LEAST S-12A, S-12B, S-12C, and S-12D are closed.
- 5: UNCONDITIONAL - WCA3A releases thru S-334 regardless of status of S12 structures.
- 6: Releases thru S-334 when WCA-3A stage is greater then the user specified depth ABOVE bottom of ZONE A and continues until WCA-3A stage is BELOW Zone A regardless of status of S12 structures.

@ NOTE: For options 1-4, S-334 is also open when WCA-3A stage is greater then the user specified depth ABOVE bottom of ZONE A and continues until WCA-3A stage is BELOW Zone A even when appropriate S12 structures are open to lessen the chance of excessive high water in WCA-3A toward the end of the wet season.

S333S334RG_OFFSET FREE

Depth (ft) ABOVE bottom of ZONE A of WCA-3A regulation schedule releases thru S334 occur regardless of status of S-12A, S-12B, S-12C, or S-12D.

 B. ADDITIONAL CRITERIA FOR DETERMINATION OF FLOOD CONTROL DISCHARGES THRU S-333/S-334:
 (1 record)
 FREE FORMAT

IS334_OPEN_FLG FREE

Option to open S-334 for passing water for benefit of Sparrow.
 If 0: closed
 1: open

FRAC_AVAIL_CAP_S333 FREE

Fraction of remaining S-333 conveyance used to pass additional water that the S12's cannot pass.

FRAC_AVAIL_CAP_S334 FREE

Fraction of S-333 additional water passed through S-334.

*****END OF ADDITIONAL INPUT FOR S-333*****

*****START OF ADDITIONAL INPUT FOR S-197*****

A. OPTION FOR SIMULATION OF S-197: (1 record)
(5X,A3)

1-5	BLANK	5X	
6-8	EARTH_PLUG_OPT	A3	Option to simulate S-197 with 3 culverts and an earthen plug or with 13 culverts. If YES: S-197 is modeled with 3 culverts and an earthen plug. NO: S-197 is modeled as 13 culverts.

B. CANALS TRIGGERING FLOOD CONTROL DISCHARGES FROM S-197:
(1 record)
(I6,2X,5(A5,1X,I3,2X))

@ NOTE: N is a canal counter. I is a counter of additional outlet structures simulated whose rating curve is known.

1-6	N_TRIGGER_FC_CNL(N,I)	I6	Number of canals used to trigger flood control discharges from S-197.
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7-8	BLANK	2X	
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@ NOTE: The arrays below are defined and the read format is repeated for
J=1,N_TRIGGER_FC_CNL(N,I).

9-13	CNL_NAME_FC(J)	A5	Name of canal triggering flood control discharges from S-197.
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14-14	BLANK	1X	
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15-17	N_TRIG_FOR_OPER(N,I,J)	I3	Number of stage triggers for operation of structure for each canal used for triggering flood control discharges from S-197.
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18-19	BLANK	2X	
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C. CANAL STAGE TRIGGERS FOR DETERMINATION OF FLOOD CONTROL DISCHARGES:
(N_TRIGGER_FC_CNL(N,I) records total)
(5(F6.2,1X))

- 2: Pump.
- 3: Culvert with flashboards or structure with impediment to flow other than diameter of pipe or gate opening.

STRDCAP(N,I,NS,J)	FREE	Design capacity of structure (cfs), which MAY OR MAY NOT be upper limit to discharge. @ NOTE: See Section 14 above.
DISCOEF(N,I,NS,J)	FREE	Discharge coefficient (cfs) with gates open full for gated structures, or maximum capacity for pumps.
PWR(N,I,NS,J)	FREE	Exponent used in rating curve equation. Usually 0.5 for gated spillway or culvert.
STGINTKE(N,I,NS,J)	FREE	Intake level (ft NGVD) of structure (used mainly for pumps). Intake level is the lowest headwater stage allowed for discharge, which could be operational or due to hydraulic limitations. @ NOTE: Value should be lower of equal to off level of pump (RMXSTGS(N,I,J)). -901 means intake level is NOT used for structure.

@ NOTE: Discharge equation is of the following form when structure rating is available:

$$\begin{aligned} \text{DISCHARGE} &= \text{DISCHARGE COEFFICIENT} * \text{FRAC_GO} * (\text{HW} - \text{TW}) ** \text{EXPON} \\ \text{WHERE:} \\ \text{HW} &\text{ IS HEADWATER (FT NGVD) AT STRUCTURE} \\ \text{TW} &\text{ IS TAILWATER (FT NGVD) AT STRUCTURE} \\ \text{FRAC_GO} &\text{ IS FRACTION OF GATE OPENING} \\ &= \frac{(\text{HW AT STRUCTURE} - \text{STAGE GATES CLOSED}) ** 2}{(\text{STAGE GATES OPEN FULL} - \text{STAGE GATES CLOSED}) ** 2} \end{aligned}$$

@ NOTE: Section 20 below is only input for pumps.

20. ADDITIONAL INPUT FOR PUMPS: (NSUBSTR(N,I) records total)
 FORMAT(I6,1X,F6.2,2X,A3) - FOR S-9
 FORMAT(I6,1X,F6.2,I3) - FOR S-356
 FORMAT(I6,1X,F6.2) - OTHER STRUCTURES

@ NOTE: N is a canal counter. I is a counter of additional outlet structures simulated whose rating curve is known. NS is a counter of components simulated for structure.

1-6	INGVHDOPT(N,I,NS)	I6	Option to discharge ONLY if tailwater is greater than headwater. If 1: Pump ONLY if tailwater is greater than headwater 0: Pump REGARDLESS of headwater and tailwater conditions.
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7-7	BLANK	1X	
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8-13	PUMP_EFFIC(N,I,NS)	F6.2	Pump efficiency.
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@ NOTE: Additional fields are input here for S-9 and S-356.

*****START OF ADDITIONAL INPUT FOR S-9*****

14-15	BLANK	2X	
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16-18	BACK_SP_PUMP_S9_OPT	A3	Option for S-9 to backpump L-33 and L-37 seepage into WCA-3A. If YES: Seepage into L-33 and L-37 is backpumped into WCA-3A. NO: Seepage into L-33 and L-37 is NOT backpumped into WCA-3A.
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*****END OF ADDITIONAL INPUT FOR S-9*****

*****START OF ADDITIONAL INPUT FOR S-356*****

14-16	ISEEP_LIM_S356_OPT	I3	Option to pump ONLY seepage thru S-356. If 1: ONLY pump seepage thru S-356. 0: PUMP all flows thru S-356.
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*****END OF ADDITIONAL INPUT FOR S-356*****

21. NUMBER OF STRUCTURES WITH MONTHLY-VARYING CAPACITY: (1 record)
FREE FORMAT

NO_STRUC_TVARY	FREE	Number of structures with monthly-varying capacity.
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22. NAME OF STRUCTURES WITH MONTHLY-VARYING CAPACITY: (NO_STRUC_TVARY records)
FREE FORMAT

STRUC_TVARY_NAME	FREE	Character string identification of
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structure with time-varying capacity.
(max of 6 characters).

23. TIME VARYING CAPACITY: (NO_STRUC_TVARY records total)
FREE FORMAT

@ NOTE: The array below is defined and the read format is repeated for IM=1,12.

FRAC_STRUC_CAP(ICANAL_STRUC_VARY,IM)	Multiplier of structure capacity during month IM.
FREE	

24. NUMBER OF CANALS TO BE MAINTAINED AT SPECIAL LEVELS WHEN WCA'S ARE BELOW FLOOR:
(1 record)
FREE FORMAT

NO_CANL_MIN_MOD_BEL_FLR	FREE	Number of canals to be maintained at lower levels when Water Conservation Areas are BELOW their floor elevation.
MONTH_BEG_MIN_MOD_FLR	FREE	Starting month for maintaining canals at lower levels if WCA's are BELOW floor (1-12).
IDAY_BEG_MIN_MOD_FLR	FREE	Starting day for maintaining canals at lower levels if WCA's are BELOW floor (1-31).
MONTH_END_MIN_MOD_FLR	FREE	Ending month for maintaining canals at lower levels if WCA's are BELOW floor (1-12).
IDAY_END_MIN_MOD_FLR	FREE	Ending day for maintaining canals at lower levels if WCA's are BELOW floor (1-31).

25. CANALS AND SPECIAL LEVELS TO BE MAINTAINED WHEN WCA'S ARE BELOW FLOOR:
(NO_CANL_MIN_MOD_BEL_FLR records total)
FREE FORMAT

@ NOTE: IC is a counter of canals to be maintained at lower levels when Water Conservation
Areas are BELOW their floor elevation. I is a season counter.

CANL_MIN_MOD_NAME	FREE	Character string identification of canal to be maintained at lower levels when
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WCA's are BELOW floor (max of 5 characters).

CRMIND_BLFR(IC,I) FREE
for I=1

Desired dry season minimum canal stage (ft NGVD) to be maintained by local and/or regional water supply sources when WCA's are BELOW their floor elevation.

CRMIND_BLFR(IC,I) FREE
for I=2

Desired wet season minimum canal stage (ft NGVD) to be maintained by local and/or regional water supply sources when WCA's are BELOW their floor elevation.

26. NUMBER OF WEIRS WITH SEASONALLY-VARYING CREST ELEVATION: (1 record)
FREE FORMAT

NREG_SEAS FREE

Number of fixed crest weirs with seasonally-varying flood control crest elevation.

27. WEIRS WITH SEASONALLY-VARYING CREST ELEVATION: (NREG_SEAS records total)
FORMAT(A5,2X,A6,2F6.1)

1-5 CANAL_NAME_REG_SEAS A5

Character string identification of canal with fixed crest weir with seasonally-varying flood control crest elevation. (max of 5 characters).

6-7 BLANK 2X

9-13 STRUC_NAME_REG_SEAS A6

Character string identification of weir (max of 6 characters) with seasonally-varying flood control crest elevation.

@ NOTE: K is a season counter.

14-19 REG(K) F6.1
 for K=1

Dry season crest elevation (ft NGVD).

20-25 REG(K) F6.1
 for K=2

Wet season crest elevation (ft NGVD).

@ NOTE: Records below list names that cannot be automated for the "B" part of the output DSS file (daily_str_flw.dss) containing simulated flows.

28. NUMBER OF SPECIAL CONDITIONS TO OUTPUT: (1 record)

FREE FORMAT

NO_IF_CONDITIONS	FREE	Number of special conditions to output.
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29. ADDITIONAL STRUCTURES TO OUTPUT: (NO_IF_CONDITIONS records)
 FORMAT(I5,2X,20(A6,1X),10(/7X,20(A6,1X)))

@ NOTE: The format below is repeated for NO_IF_CONDITIONS records. Structure names are listed in a record if certain conditions are met:

RECORD #	Condition to be met for listing structures in record:
1	List unconditionally.
2	If there are STA's in the simulation.
3	If there are STA's in the simulation or BMP Makeup Water Rule is in effect.
4	If EAA runoff is routed to STA-3/4.
5	If L-8 Basin current plumbing system and operation is simulated (ip flag #23 in lecdef input file equals 0).
6	If proposed L-8 Basin plumbing system and operation is simulated (ip flag #23 in lecdef input file equals 1).
7	If Rainfall Plan or NSM-based targets are used for deliveries to Shark River Slough (as specified in lecdef input file).
8	If North Storage is simulated for Lake Okeechobee.
9	If Seminole demands in Big Cypress Basin are simulated.
10	If runoff from any major EAA Basins is diverted to ASR.
.
.
.
NO_IF_CONDITIONS

1-5	NADDSTR	I5	Number of structures that meet criteria above for listing in record.
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6-7	BLANK	2X
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@ NOTE: I is a counter of additional structures to output.

8-13	STRNAME(I)	A6	Character string identification of structure (max of 6 characters).
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14-14	BLANK	1X
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@ NOTE: A maximum of 20 structures can be listed in each line. Input as many lines as needed to define the total number of structures for the record. If more than 20 structures are listed (NADDSTR>20), the format of the subsequent lines is slightly

different (The first 7 columns are blank, 7X).

30. ADDITIONAL STRUCTURES TO OUTPUT IF STA'S RECEIVE INFLOW FROM SOURCE OTHER THAN
RESERVOIR: (1 record)
FORMAT(7X,10(A6,1X))

@ NOTE: I is a counter of additional structures to output.

1-7	BLANK	7X	
8-13	STRNAME(I)	A6	Character string identification of structure to list if STA's receive inflow from source other than reservoir in the simulation (max of 6 characters).
14-14	BLANK		

31. ADDITIONAL STRUCTURES TO OUTPUT IF THERE ARE INFLOW STRUCTURES TO RESERVOIRS FROM EAA
BASINS: (1 or more lines)
FORMAT(I5,2X,20(A6,1X),10(/7X,20(A6,1X)))

@ NOTE: I is a counter of additional structures to output.

1-5	NADDSTR	I5	Number of additional structures to output.
6-7	BLANK	2X	
8-13	STRNAME(I)	A6	Character string identification of structure to list if there are inflow structures to reservoirs from EAA Basins (max of 6 characters).
14-14	BLANK	1X	

@ NOTE: A maximum of 20 structures can be listed in each line. Input as many lines as
needed to define the total number of structures. If more than 20 structures are
listed (NADDSTR>20), the format of the subsequent lines is slightly different
(The first 7 columns are blank, 7X).

32. ADDITIONAL STRUCTURES TO OUTPUT: (1 or more lines)
FORMAT(7X,20(A6,1X),10(/7X,20(A6,1X)))

@ NOTE: The format below is repeated for several lines. Structure names are listed in a
line if certain conditions are met:

LINE #	Condition to be met for listing structures:
1	If there is environmental water supply from MORE THAN ONE EAA Reservoir.
2	If there are reservoir outlets to the EAA Basin.
3	If runoff from any of major EAA basins is diverted to proposed reservoir(s).
4	or proposed Reservoir/ASR system.
	If there is recovery from ASR in a reservoir to a canal.
1-7	BLANK 7X

@ NOTE: I is a counter of additional structures to output.

8-13	STRNAME(I)	A6	Character string identification of structure to list (max of 6 characters).
14-14	BLANK	1X	

@ NOTE: A maximum of 20 structures can be listed in each line.

END OF DESCRIPTION FOR INPUT FILE "canal_struc_specs.dat"
